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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 769,193	01/25/2001	Sungho Jin	JIN 210-33-6	4344

7590 03/31/2003

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EXAMINER

DOAN, JENNIFER

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 03/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/769,193

Applicant(s)

JIN ET AL.

Examiner

Jennifer Doan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 13 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. Applicants' cooperation is requested in correcting any errors of which applicants may become aware in the specification.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 4, 5, 8, 9, 14-25, 29, 30 and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Tilmans et al. (U.S. Patent 6,297,072).

Regarding claims 1, 20 and 24, Tilmans et al. disclose (Fig. 16) a method and an apparatus micro-electro-mechanical (MEMS) device comprising a component layer (162) having a frame and at least one component movably connected to the frame (column 7, line 1- column 8, line 15); an actuator layer (161) having at least one conductive path and one actuator for moving the component (column 7, lines 23-32); at

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least one spacer to separate the component layer and the actuator layer by a vertical gap spacing, the spacer optionally being from or part of the component layer and/or the actuator layer (as shown in Fig. 16 and column 7, lines 15-50) and at least one resilient member coupled to the component layer and the actuator layer, wherein the component layer, spacer and actuator layer are held in laterally-aligned and vertically spaced relation by resilient force from the resilient member (column 7, lines 15-50).

Regarding claims 2 and 25, wherein the component layer (162, Fig. 16) and the actuator layer (161, Fig. 16) have facing surfaces, each having a planar configuration as shown in Fig. 16.

Regarding claim 4, wherein the component layer, the spacer and the actuator layer are laterally self-aligned by alignment slots, protruding features or stepped edges present in one or more of the layers (column 10, lines 9-15 and column 12, lines 7-10).

Regarding claims 5 and 17, wherein the spacer aerodynamically isolated the mirror by blocking at least 20% of the peripheral area underlying the component (column 8, lines 1-15).

Regarding claims 8, 9, 29 and 30, wherein the component layer comprises single crystal silicon (column 7, lines 2-3).

Regarding claim 14, wherein the spacer is comprised of ferromagnetic material (column 7, lines 1-50).

Regarding claims 15 and 21, wherein a transparent plate is disposed overlying the component layer (column 9, lines 47-49).

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Regarding claim 16, wherein the spacer includes walls defining a cavity below the component and the walls are conductive to electrostatically isolate the component (column 8, lines 1-15).

Regarding claims 18 and 19, wherein the resilient member is coupled to the component layer or the actuator layer by solder bonding, fusion bonding, glass frit bonding or adhesive bonding (column 7, lines 1-50).

Regarding claims 22 and 23, wherein the resilient member is hermetically sealed to the actuator layer and the transparent plate to hermetically package the MEMs device (column 7, lines 1-32).

Regarding claim 33, wherein the assembly is performed at ambient temperature (column 8, lines 2-15 and column 9, lines 29-40).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3, 6, 7, 10-13, 26-28, 31, 32 and 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tilmans et al. (as cited above).

Tilmans et al. disclose all the limitations of the claimed invention except for the component layer or the actuator layer having a mesa configuration as recited in claims 3 and 26. However, it would have been an obvious matter of design choice to employ the component layer or the actuator layer having a mesa configuration, since such a modification would have involved a mere change in the figure of a component. A change in form or shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey*, 149 USPQ 47 (CCPA 1976).

Tilmans et al. disclose all the limitations of the claimed invention except for the components comprising movable mirrors having a coating of metal as recited in claims 6, 10 and 27. However, components comprising movable mirrors having a coating of metal is considered to be obvious, since making the components as mirrors having a coating of metal is one of many means to reflect the optical signals. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Tilmans' s components with the mirrors for reflecting the optical signals.

Tilmans et al. disclose all the limitations of the claimed invention except for the actuator layer having a mirror image pattern of the component layer as recited in claim 7. However, the actuator layer having a mirror image pattern of the component layer is considered to be obvious, since making the component layer as mirror image of the actuator layer is one of many modifications to reflect the optical signal. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Tilmans' s device with the actuator layer having a mirror image pattern of the component layer for reflecting the optical signals.

Tilmans et al. disclose all the limitations of the claimed invention except for the spacer having a coefficient of thermal expansion different from the component layer and the actuator layer not more than 50% as recited in claims 11 and 31. Even so, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the spacer with CTE different from the component layer and the actuator layer not more than 50%, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Tilmans et al. disclose all the limitations of the claimed invention except for the spacer comprising a material selected from the group consisting of Si, Mo, W, Zr, Hf, Ta, Ti, F-Ni alloys or Fe-Co-Ni alloys as recited in claims 12 and 32. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ for the spacer comprising a material selected from the group as above, since it has been held to be within the general skill of a worker in the art to select a

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known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Tilmans et al. disclose all the limitations of the claimed invention except for the range of the resilient coupling at least 5 micrometers as recited in claim 13. Even so, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ for the range of the resilient coupling at least 5 micrometers, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Tilmans et al. disclose all the limitations of the claimed invention except for an optical power gain equalizer system, a wavelength division multiplexer, a light signal switch and a variable optical attenuator as recited in claims 34-37. However, the optical power-gain equalizer system, wavelength division multiplexer, light signal switch and variable optical attenuator are considered to be obvious, since the optical power-gain equalizer system, wavelength division multiplexer, light signal switch and variable optical attenuator are commonly used in an optical communication system. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Tilmans' s device with the optical power-gain equalizer system, wavelength division multiplexer, light signal switch and variable optical attenuator. Doing so would achieve the effective MEMs device to obtain the higher switching capacity.

### ***Response to Arguments***



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7. Applicants' communication filed on January 13, 2003 has been carefully studied by the Examiner. The arguments advanced therein are persuasive. The final rejection is withdrawn. In view of further search, however, and the consequent discovery of a relevant prior art document, a new rejection is set forth below. This action is **not** made final.

The Terminal Disclaimer, filed on January 13, 2003, is effective to overcome the provisional obviousness-type double patenting rejection under copending Application No. 09/769,192.

### ***Conclusion***

8. Applicants' arguments with respect to claims 1-37 have been considered but are moot in view of the new ground(s) of rejection.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bornand et al. (U.S. Patent 5,430,421) disclose a metallic microstructure. And Stern (U.S. Patent 5,771,321) disclose an optical coupling switch.

10. Any inquiry concerning the merits of this communication should be directed to Examiner Jennifer Doan whose telephone number is (703) 308-6179. The examiner can normally be reached on Monday to Friday from 6:30 am to 4:00pm, second Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick, can be reached on (703) 308-4819. The fax phone

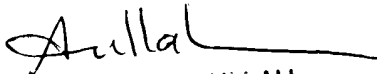
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number for the organization where this application or proceeding is assigned is (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
AKM ENAYET ULLAH  
PRIMARY EXAMINER

JD JP

March 17, 2003